Claims

1. Optical waveguide, which is part of an integrated optical circuit, the optical waveguide being arranged onto a planar support and having a core section conveying light to a certain direction, the direction of propagation, **characterised** in that the optical waveguide is a modified optical waveguide (60) between a ridge-type optical waveguide (61) and a rectangular optical waveguide (62), in which modified optical waveguide the core section is made of the one and same material so that the cross-section of the core section transverse to the direction of propagation (z) of light is two-step (6; 6^{1a}, 6^{2a}; 6^{1b}, 6^{2b}) from both edges (60a, 60b), and in which modified optical waveguide there are two layers (60^1, 60^2) of different widths (l_{60a}, l_{60b}), the height (h_{60a}) of the first layer (60^1) being equal to the height of the ridge (61^1) of the ridge-type optical waveguide (61), and the height (h_{60b}) of the second layer (60^2) being equal to the height of the base part (61^2) of the ridge-type optical waveguide (61), and in which the sum of the heights (h_{60a}, h_{60b}) of the layers (60^1, 60^2) is equal to the height of the rectangular optical waveguide (62), the widths of the two layers (601, 602) being arranged to change uniformly between the optical waveguides to be connected for fitting them together laterally.

2. Optical waveguide according to claim 1, **characterised** in that the optical waveguide (60) is made of semiconductor material, especially silicon.

3. Optical waveguide according to claim 2, **characterised** in that the optical waveguide (60) is made onto a SOI support.

4. Optical waveguide according to claim 1, **characterised** in that the widths (l_{60a}, l_{60b}) of the layers (60^1, 60^2) of the optical waveguide (60) are arranged to change linearly between the ridge of the ridge-type optical waveguide (61) and the rectangular core section of the rectangular optical waveguide (62) of different widths for connecting them together with the help of the optical waveguide (60).

5. Method for manufacturing an integrated optical circuit onto a support, **characterised** in that the optical waveguide is a modified optical waveguide (60), which is manufactured between the ridge-type optical waveguide (61) and the rectangular optical waveguide (62) onto such a support (7), on which there is a light-conveying core section (7c), in which method the core layer (7c) is controllably thinned in two stages for forming two different steps on both sides of the modified optical waveguide so that different process patterns are utilised in both thinning stages, the edges of which determine the location of the edges of the steps of the optical

waveguide on the support, so that the result obtained is a optical waveguide structure, which is two-step (6; 6^{1a}, 6^{2a}; 6^{1b}, 6^{2b}) from both edges (60a, 60b) transverse to the direction of propagation of light, in which the modified optical waveguide (60) is provided with two layers (60^1, 60^2) of different widths (l_{60a}, l_{60b}) so that the height (h_{60a}) of the first layer (60^1) is arranged to be equal to the height of the ridge (61^1) of the ridge-type optical waveguide (61), and the height (h_{60b}) of the second layer (60^2) is arranged to be equal to the height of the base part (61^2) of the ridge-type optical waveguide (61), and in which the sum of the heights (h_{60a}, h_{60b}) of the layers (60^1, 60^2) is arranged to be equal to the height of the rectangular optical waveguide (62), and the widths of the two layers (601, 602) are arranged to change uniformly between the optical waveguides (61, 62) to be connected for fitting them together in the lateral direction.

6. Method according to claim 5, **characterised** in that the optical waveguide (5) is manufactured onto a suitable finished support (7), such as a SOI wafer or similar.

7. Method according to claim 5 or 6, **characterised** in that one common hard mask layer (9; 9^1) is used in it for providing at least two different process patterns to the core layer (7c) of the support.